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No. 45

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FUELS

FUELS

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PETROLEUM INDUSTRY ACHIEVEMENTS, GOALS

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 11, Nov 80 pp 3-6

/Article by First Deputy Minister of the Petroleum Industry V. I. Kremnev: "The Petroleum Industry Workers Go to Meet the 26th CPSU Congress"/

/Text/ The workers of the petroleum sector, like all the workers of the country, responded with enthusiasm to the decision of the June (1980) CPSU Central Committee Plenum on the convocation of the 26th CPSU Congress.

The preparation for the regular party congress requires of the managers of enterprises a critical analysis of their activity on the fulfillment of the decisions of the 25th CPSU Congress. The collectives of the enterprises and organizations of the petroleum industry of the country during the past years of the 10th Five-Year Plan have done much productive work, which is attested by the achieved results. In four years of the 10th Five-Year Plan the petroleum industry workers provided the national economy with 83.7 million tons of petroleum with gas condensate more than was produced during the Ninth Five-Year Plan and obtained just as much natural and petroleum gas as was obtained during the last five-year plan. During the years of the 10th Five-Year Plan the amounts of drilling work increased more than 1.5-fold. For the sector as a whole more than 150 new petroleum deposits were put into operation, while the stock of wells increased by 21,000 units. Many oil field facilities, large gas processing plants and heavy-duty main petroleum pipelines were put into operation.

The policy outlined by the party of developing Western Siberia--one of the main fuel and power bases of the country--is being successfully implemented. In four years of the 10th Five-Year Plan 25 million tons more of petroleum were produced here than was stipulated by the five-year assignment, much work was performed on the development of resources of natural gas, its utilization ratio increased from 17 percent in 1975 to 51 percent in 1979.

In spite of the difficulties connected with the continuous complication of the geological mining conditions, the petroleum industry workers were able for the sector as a whole to create a base for the increase of the level of production of petroleum with gas condensate in 1980 by 115 million tons as against 1975.

These achievements are the result of the joint efforts of the numerous labor collectives of the petroleum industry. Thus, the drillers are steadily increasing the amount of drilling operations and are improving the technical and economic

indicators, ensuring an increase of the petroleum production capacities. In production drilling alone in 1979 the sinking increased as compared with 1975 from 8.6 million m to nearly 13 million m. The increase of production drilling predominates in the most promising regions--Western Siberia, the Udmurtskaya ASSR, the Komi ASSR and the Georgian SSR. It is typical that the increase of sinking was achieved, in contrast to the past periods, primarily owing to the increase of labor productivity. Thus, with an increase of the amount of drilling during the past years of the 10th Five-Year Plan by 36.8 percent the number of drilling brigades increased by only 5.3 percent.

The reduction by nearly 27 percent of the average term of development of wells, which was achieved in four years, is of great importance. Here the expenditures of time on the development of wells were reduced from 35 to 26 days. There is no doubt that in drilling organizations the reserves for increasing the amount of drilling by means of the further increase of production efficiency are still far from exhausted.

The construction workers, who are building up the fields and constructing the petroleum and gas pipelines, the most important production facilities, apartment houses and sociocultural institutions, have made a large contribution to the development of the petroleum industry. In Western Siberia alone they performed 2.6-fold more work in four years of the 10th Five-Year Plan than during the same period of the Ninth Five-Year Plan. And still with respect to the most important indicator--the placement of new capacities into operation--the construction workers did not always meet the set deadline. Some of the blame here belongs to the clients, who often display great disorganization in drawing up the design documents and providing construction projects with complete sets of equipment.

Much attention during the past years of the 10th Five-Year Plan was devoted to the implementation of the instructions of the 25th CPSU Congress on increasing the efficiency and quality of scientific research. Following these instructions, scientific research organizations brought the themes of their work significantly closer to the immediate needs of the development of the sector and constantly improved the forms of the contact of science with production. Many valuable developments were successfully achieved by scientists in close cooperation with production specialists.

Thus, the serious problems of controlling the corrosion of equipment and the depositing of salts and paraffin in wells and pipelines were solved, the processes of working deposits were improved, new rock-breaking tools, bottom hole motors and equipment for preparing and purifying drilling muds and others were developed and introduced. The work on the improvement of the new methods of increasing the extraction of petroleum and of the industrial methods of oil field development and on the increase of the reliability of the operation of main petroleum pipelines was continued. More than 2,000 scientific developments were achieved at the level of inventions. It is impossible not to note the great contribution which is being made by rationalizers and inventors to the improvement of the technology of production and the increase of its efficiency. One worker of the sector in 10 is now a rationalizer.

A production automation program, which provides for an increase during the five-year plan of the number of completely automated fields from 137 to 240 with the coverage of 47,000 wells and a total annual production of more than 490 millions tons, has

been implemented at the oil fields. Considerable work has also been done to automate production in main petroleum pipeline transport. Here, as well as at petroleum and gas drilling administrations and administrations of drilling operations, the number of automated control systems with the use of computers is increasing. The number of such systems for the sector already comes to 95. Along with the gathering and processing of information they ensure the calculations and choice of the optimum production conditions.

The petroleum pipeline transport of the sector during the 10th Five-Year Plan acquired greater and greater importance, having been transformed into a major and complex system, on the reliable and precise operation of which the activity of the entire sector depends to an enormous extent. Its development is connected first of all with the petroleum- and gas-producing regions of Western Siberia, the Komi ASSR, the Udmurtskaya ASSR and the Georgian SSR. At present more than 95 percent of the produced petroleum is transported to the refining sites via pipelines. The freight turnover here increased by 74 percent.

In conformity with the decisions of the 25th CPSU Congress much work on increasing the degree of utilization of petroleum gas, which required considerable material resources and the efforts of construction organizations and the workers of the Soyuzneftegazpererabotka Association, has been done in the sector. For this the capacities for the processing of 8 billion m^3/year of gas were built and new gas pipelines were laid for its collection and transportation. As a result the level of the utilization of gas, given the increase of the production volume, rose from 57.8 percent in 1975 to 70.8 percent in 1979. At the same time many reserves have still not been utilized, which obliges the managers of enterprises to devote constant attention to this important problem.

Along with the development of the sector according to the main volumes and quality indicators, the economic work continues to be improved. The problem consisted in turning the economy of the enterprises in the direction of an increase of the profitability of production and its subordination to the achievement of high end results of economic activity. The implementation of these measures was stepped up with the issuance of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality." Some associations have already done the preliminary work and have reflected some of the new evaluation indicators in the plan for the current year. The first results testify in favor of the new system of management. Undoubtedly this will make it possible to put additional reserves to work, which is especially important during the preparation for work during the 11th Five-Year Plan. At the same time it would be premature to evaluate the results of the work of the sector during the 10th Five-Year Plan without consideration of the anticipated results of the final year.

The preliminary data attest to the conformity of the race of work to the plan assignments for 1980. In eight months the production of petroleum has exceeded the state plan, while its increase as compared with the same period last year was 13.6 million tons. The plan on gas production was also exceeded. The production of petroleum in Western Siberia and at the Komineft' and Udmurtneft' Associations continues to be developed rapidly. The plan on drilling operations for the sector was fulfilled by 100.3 percent; the amount of drilling increased as compared with the same period last year by 21.3 percent. The commerical rate of both production

and development drilling is increasing, the average term of development of wells has been additionally shortened.

Consequently, all the necessary conditions exist for the successful completion of the 10th Five-Year Plan, but nevertheless the managers of enterprises should not lessen the intensity and should prevent in due time any surprises in work, which upset the established production rhythm.

An important role in accomplishing the tasks, which were set for the sector by the decisions of the 25th CPSU Congress, belongs to socialist competition, which during the years of the 10th Five-Year Plan became to a greater and greater extent a means of expressing the creative initiative of the workers. It is difficult to overestimate the contribution of the leading collectives during socialist competition to the gains made by the petroleum industry. The competition in honor of the 110th anniversary of the birth of V. I. Lenin took place in an atmosphere of great activeness. By that date about 600 collectives of enterprises, organizations and brigades had reported the fulfillment of the five-year assignment.

The labor collectives of the petroleum industry have joined the national socialist competition for a worthy greeting of the 26th party congress and are directing their efforts toward the successful fulfillment and exceeding of the plans of the final year of the five-year plan and toward the creation of reliable conditions for the steady work of the sector in 1981--the first year of the 11th Five-Year Plan.

Continuing the Leninist special work effort, the best collectives of the brigades of leading occupations, which fulfilled the five-year assignments, have assumed new obligations on the exceeding of the assignments of the final year of the five-year plan. The national patriotic movement under the slogan "A Shock Work Finish for the Five-Year Plan. A Worthy Greeting to the 26th CPSU Congress" has been supported by the collectives of the Yuganskneftegaz, Bashneft' and Grozneft' associations, petroleum- and gas-production administrations and administrations of drilling operations.

The initiative of the pacemakers has found extensive support. More than 3,750 collectives of enterprises, organizations, shops, brigades and sections have assumed greater socialist obligations for 1980 and by the day of the opening of the 26th CPSU Congress. As always the collectives of drilling brigades are at the head of the socialist competition. And the collective of the brigade from the Nizhnevartovsk Administration of Drilling Operations No 1 of the Main Administration for Petroleum and Gas for the Tyumen' Region, which is managed by drilling foreman and Hero of Socialist Labor G. M. Levin, continues to be the best among them. On 10 September the collective again gained a labor victory, having drilled the millionth meter of rock since the start of the development of the Samotlor petroleum deposit (1968).

The drilling brigade of foreman and Hero of Socialist Labor A. D. Shakshin from the Nizhnevartovsk Administration of Drilling Operations No 2 was one of the first to report in November 1979 the fulfillment of the five-year assignment. The initiative of the group of Groznyy drilling foremen, which pledged to develop in 1.5 years wells with a depth of 5,000 m and more, is of enormous importance for the sector.

During the precongress competition the brigades of the current and major repair of wells of foremen Sh. M. Minnetdinov (Tatar Petroleum Association) and A. M. Mordochev (Turkmen Petroleum Association), as well as the brigades for the production of petroleum and gas of foremen F. F. Mukovoz (Main Administration for Petroleum and Gas for the Tyumen' Region) and A. Z. Galiyev (Tatar Petroleum Association) are displaying examples of highly efficient work. They are all working under the conditions of identical material and technical supply with other brigades, but are achieving high results. The better their valuable know-how is utilized, the more new reserves will be aimed at the successful fulfillment of the obligations in honor of the 26th party congress.

In the work on organizing the successful fulfillment and exceeding of the plans of the 10th Five-Year Plan and on preparing for a worthy greeting of the forthcoming congress the petroleum industry workers are guided by the instructions of Comrade L. I. Brezhnev at the June (1980) CPSU Central Committee Plenum. In his report L. I. Brezhnev said: "It is necessary to exert the maximum effort--and this is worth emphasizing--in order to successfully fulfill and exceed the plan of the final year of the 10th Five-Year Plan, to put start-up projects into operation in due time, to ensure the stable work of the national economy in 1981--the first year of the 11th Five-Year Plan...." These tasks are of enormous importance for the petroleum industry as one of the key sectors of the national economy.

Considerable capital investments have been allocated in 1980 for the development of the petroleum sector. It is necessary to put into operation 4,100 km of main petroleum pipelines with a large number of petroleum pumping stations, 4,700 km of electric power transmission lines, 500 km of new hard-surface roads, new gas processing capacities and a large number of facilities of oil field development, as well as 1.2 million m^2 of total living space, schools, medical institutions, enterprises of trade and public dining. Although for the most part the construction ministries are carrying out this work, the petroleum industry workers as the clients should in close contact with them ensure the normal rhythm of the work.

The timely, carefully considered preparation for operation during the fall-winter period is one of the most important conditions of the steady operation of enterprises of the petroleum industry in 1981. In spite of the obtained experience of past years, the Azneft' Dagneft' and Turkmenneft' associations most often suffer from interruptions in the operation of enterprises, which are caused by adverse conditions, while in Western Siberia, where the temperature in the winter reaches -50°C, the enterprises operate continuously.

The preparation for winter should not be limited to putting facilities in a condition which is capable of withstanding severe weather conditions. The monitoring of the production stock of wells should be stepped up and its continuous maintenance should be ensured. The demands on the quality of the overhaul of wells and the maintenance of the optimum conditions of their operation must not be reduced. Delays in the overhaul of wells, owing to which the latter accumulate during the winter period as temporarily shut-in wells, are all the more intolerable.

The timely realization of the stocks for material and technical resources and the creation of the necessary reserves for the fall-winter period, especially in remote and hard-to-reach regions, also govern the preparation for winter. At the same time the shortcomings in the storage and use of material and technical resources, which exist at some enterprises, should be resolutely eliminated. It is necessary to

see in good time to the placement into operation of warehouse facilities, railroad sidings and unloading platforms and to measures on the safekeeping of physical assets. The timely placement into operation of trade and public dining facilities, the further development of sovkhozes and subsidiary farms and the increase of the procurement and laying in of potatoes and vegetables of the 1980 crop are of great importance for the petroleum industry workers. The dormitories and apartment houses of the petroleum industry workers should be completely readied for the winter, so that the inclement weather would not affect the living and working conditions of the workers.

The assurance of the operational reliability of the equipment being used and, first of all, the monitoring of the quality of the equipment, pipe, tools and materials, which are being delivered by associated ministries, is necessary for preparing for steady work in 1981. Many oil drilling associations have set up within them departments of reliability, while the enterprises of the Ministry of Chemical and Petroleum Machine Building have set up technical supervision services. The joint work of these subdivisions has improved somewhat the quality of the equipment, but the problem has not yet been completely solved.

During the first half of 1980 at the associations 17,000 units of received equipment were checked, of which 527 were defective and not in complete sets. At the same time it was ascertained that the petroleum industry workers lodged complaints against the suppliers for only half of these products. The work in this direction is for the present still being performed unsatisfactorily at the Belorusneft', Nizhnevolzhskneft', Turkmenneft', Embaneft', Uzbekneft', Krasnodarneftegaz and Orenburgneft' associations.

Among the urgent problems of management the saving of fuel and energy resources and metals occupies a prominent place. At enterprises and scientific research organizations it is necessary to perform regularly work on reducing the power-output ratio of technological processes, to develop light-weight metal components and to reduce the consumption of metal. Many useful technical ideas and practical suggestions are known for solving these problems. But for the present they are still being implemented very slowly.

The utmost increase of the level of the organizing work of the managers of all the units of production serves as the basis of the successful fulfillment of the tasks, which are connected with the preparation for work during the coming period, since at many enterprises it is still not high. Not by chance did a serious discussion on this take place at the out-of-town meeting of the Collegium of the Ministry of the Petroleum Industry in Oktyabr'skiy. It must not be forgotten that the modern oil drilling association is a complex network of economic relations, which, moreover, is becoming more and more ramified. The lack of good organization and the precise interaction of all services and of strict planning discipline can easily upset the established production rhythm and lead to losses of petroleum production.

The difference in the levels of organizing work at two associations with approximately the same natural and climatic conditions: Bashneft', where in spite of the difficult conditions connected with the maintenance of a high level of production all the enterprises are working efficiently and smoothly, and Permneft', where the organizing work is poorer and its results are appreciably worse, was indicated at the meeting of the collegium. The most serious attention should be devoted to the improvement of this work, otherwise the set tasks will be fulfilled ineffectively.

The petroleum industry workers have always fulfilled honorably the tasks set for them by the party and the government, displaying in this great creative initiative and labor activeness. In meeting the 26th CPSU Congress, the workers of the petroleum industry, true to their traditions, will henceforth seek and find reserves and will resolutely remove the obstacles in work so as to fulfill in good time the assignments which ensure a successful start of the 11th Five-Year Plan.

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EFFICIENT USE OF FUEL, ENERGY RESOURCES

Moscow NEFTYANIK in Russian No 10, Oct 80 pp 12-16

/Article by I. Grekhov, R. Dzhemileva, V. Klyucharev and Yu. Tikhomirov, All-Union Scientific Research Institute of Complex Fuel and Energy Problems: "Use Fuel and Energy Resources Economically and Efficiently"/

/Text/ Considerable amounts of boiler and furnace fuel, electric power and thermal energy are consumed in the oil drilling industry, in its basic and ancillary production, as well as for municipal needs. In the presented article an analysis of the consumption of fuel and energy resources at the enterprises of the sector is given and means of their most efficient use and saving are proposed.

The oil drilling industry is an important sector of the national economy, which has developed dynamically in recent decades in connection with the steady increase of the demand for petroleum and petroleum products for the supply of all types of transport, mobile and stationary power engineering, raw material needs and export deliveries. In 1980 the production of petroleum and gas condensate in the country will exceed 600 million tons. But in order to produce petroleum and gas, it is necessary to consume considerable amounts of fuel and enery for the supply of production processes and for municipal and everyday needs. Thus, for example, at the enterprises of the Ministry of the Petroleum Industry in 1979 boiler and furnace fuel, electric power and thermal energy equivalent to 23.6 million tons of conventional fuel were consumed. In connection with the fact that the most valuable types of fuel--petroleum, petroleum products and gas--are being used for its own needs, the problem of saving and increasing the efficiency of the use of fuel and energy resources is especially urgent for the sector.

In recent years the Ministry of the Petroleum Industry has performed much work on the retooling of petroleum and gas production on the basis of airtight systems of the collection, preparation and transportation of petroleum and the introduction of its tankless delivery. These measures and the more and more extensive use of electric power have made it possible in four years of the 10th Five-Year Plan to reduce the total consumption of fuel and thermal energy by 11.6 million tons of conventional fuel. Much has been done, but it must be noted that not all the reserves for saving fuel and energy are yet being utilized in the sector. In particular, it is necessary to evaluate all the technically feasible methods of increasing the efficiency of their use, as well as the possibilities of replacing them with less expensive and more efficient types of resources. It is quite clear that the plans of

the development of the sector and its enterprises should stimulate the maximum possible involvement in the national economic turnover of economically efficient and at the same time less energy-consuming types of equipment, technological processes and production systems.

Various types of fuel, electric power and thermal energy are used extensively in the petroleum industry. At the same time the losses of fuel during its transportation and storage amount of 18 percent, while the losses of thermal energy come to 1.4 percent and those of electric power come to 1.1 percent. It is not by chance therefore (along with other reasons) that the consumption of electric power in 1979 as compared with 1975 increased by 11.4 percent, while the consumption of boiler and furnace fuel and thermal energy declined during the same period by 42.9 percent and 7.5 percent respectively.

Since the Ministry of the Petroleum Industry consumes various fuel and energy resources for its own production, municipal and everyday needs, it is expedient to examine the efficiency of their use and the methods of increasing it and saving resources themselves for the three main types: the efficiency of the use of electric power, thermal energy and fuel.

Electric Power

The oil drilling enterprises of the Ministry of the Petroleum Industry receive practically all their electric power from state power systems--99.77 percent, while the proportion of their own generation is negligible--0.23 percent. The merit of the great centralization of electric power generation is determined by the fact that it is most advantageous to provide all the sectors of the national economy with electric power from highly economical electric power stations, which operate in the power systems, while it is advantageous to use small power generating plants, which consume critical types of fuel and have a low efficiency, only where there are no other power supply sources.

The received electric power is used primarily for the production and transportation of petroleum and gas through main pipelines (nearly 80 percent). The pattern of the consumption of electric power according to the data for 1979 is cited in Table 1.

Table 1

Direction of consumption	Amount of consumption, percent
For petroleum production	40.44
For drilling wells	2.6
For transporting petroleum through main pipelines	38.04
For output of products of machine building and metalworking	0.19
For processing of gas	6.01
For output of other types of products with a regulated consumption of energy	6.22
For production needs with an unregulated consumption of energy	0.44
For municipal and everyday needs	0.76
Energy released on the side	5.3
Total	100.0

At the oil fields electric power is consumed for the raising of liquid (petroleum and water) from the wells to the surface, its pumping within the territory of the petroleum- and gas-drilling administration, the maintenance of the formational pressure and the preparation of the petroleum. Precisely in these directions it is first of all necessary to conduct an active search for reserves to save energy, to introduce advanced technical and economic solutions which ensure an increase of the efficiency of the use of energy resources. Indeed, at the oil fields the synchronous motors of the drive of the pumps are the most power-intensive consumers of electric power. Means of their efficient use for balancing the reactive power have been developed and are being successfully used, since, when working in a mode of overexcitation, a synchronous motor can release reactive power into the circuit. By means of this the power coefficient of power supply substations is increased, the losses in circuits and transformers are reduced and a considerable saving of electric power is ensured.

Much work on reducing nonproductive expenditures of electric power has been done recently by the workers of the power services of petroleum pipeline administrations. But here, too, there are still great reserves for saving electric power, which are connected with its most efficient use in the electric drive, the technological equipment of the pumping stations, the loopings and the petroleum pipelines as a whole. It is most essential from the point of view of saving electric power to choose properly the power of the electric drive of the main and backup pumps of the station, as well as of the auxiliary electric motors of units and objects (oil and lubrication, the leakage of seals, blowers, boiler, fire and water pumps). At the same time only skilled operation can ensure the economical and reliable operation of the electrical equipment of pump houses and the entire petroleum pipeline as a whole.

It is well known, for example, that the consumption of electric power for the main pumps of the main line to a considerable extent depends on the conditions of the petroleum pipeline and the filter-sludge traps, the load of parallel petroleum pipelines, the choice of the mode of regulation of the productivity of the pumping units installed at the station and their actual efficiency. Thus, only the timely cleaning of the walls of the pipe and the filters, the regular monitoring of the operation of the pumping units and the efficient organization of the operation of the systems of auxiliary equipment of the petroleum pumping stations are capable of providing a significant saving of electric power. Inexpensive measures like these can and should be used first of all. Monitoring and stimulation on the part of the interested services of enterprises and the ministry are of great importance for this.

The comparative analysis of the reporting data on the use of fuel and energy resources in the oil drilling sector makes it possible to conclude that of all the types consumed by it the consumption of electric power is taken most completely into account. Planning norms are being set for practically all types of products and operations.

Thermal Energy

The oil drilling enterprises of the sector obtain the bulk of thermal energy--about 90 percent--from their own boiler plants and the remaining 10 percent from the boiler plants of enterprises of other departments. The fact that almost no thermal energy is received from heat recovery plants and their own electric power stations

attracts attention. Nearly half of the obtained thermal energy is consumed for the production of petroleum and gas and for the processing of gas, about 9 percent is consumed for municipal and everyday needs, about 25 percent of it is released to various enterprises of other departments. The pattern of the consumption of thermal energy by enterprises of the Ministry of the Petroleum Industry is cited in Table 2.

Table 2

Direction of consumption	Amount of consumption, percent
For petroleum production	28.79
For gas production	8.66
For processing of gas	10.03
For production of reinforced concrete components	0.11
For output of products of machine building and metalworking	1.55
For output of other types of products with regulated consumption	2.97
For other needs with unregulated consumption of energy	13.24
For municipal and everyday needs	8.81
Energy released on the side	25.84
Total	100.00

The thermal energy received by enterprises is used in the form of steam and hot water in the technological processes of drilling wells, affecting productive horizons when extracting highly viscous petroleums and petroleum from old wells, for the dehydration of petroleum and the processing of petroleum gas, the heating and ventilation of municipal, everyday and production buildings. It is also consumed for the production of reinforced concrete components, for machine repair operations and other needs.

By reducing the losses and increasing the efficiency of the use of thermal energy in the main sections of its transportation and use the energy services of oil fields, gas processing plants and other enterprises can obtain a significant saving of fuel and energy. For this it is necessary to constantly keep track of the quality of the insulation of pipelines, to use insulating materials with improved properties more extensively, to organize and strictly monitor the purification, collection and return to the boiler houses of the spent condensate, to equip all the sections with instruments for the automatic control of the release and consumption of thermal energy. It is also expedient to increase the thermal insulation of production buildings and municipal and everyday facilities (especially in the regions with a lengthy heating season). It is necessary to introduce everywhere more improved heat-consuming equipment, as well as less energy-consuming technological processes, which replace the processes with the use of steam and hot water.

As estimates show, by means of the adoption of heat-saving measures not less than 15-20 percent of the thermal energy can be saved as compared with the level which was achieved during the last year of the 10th Five-Year Plan. Let us also note that a sufficiently large portion of the consumption of thermal energy is controlled by planning norms. However, for the purpose of further tightening up the monitoring of its use it is necessary to broaden even more the group of production processes, with respect to which scientifically sound rates of consumption of thermal energy should be established.

Boiler and Furnace Fuel

There are used in the sector as boiler and furnace fuel gas (84.3 percent of the total consumption of boiler and furnace fuel), fuel oil (14.6 percent), coal (0.4 percent), gasoline and other petroleum products (0.1 percent). The structure of the used boiler and furnace fuel according to the data of 1979 and the directions of its consumption are cited in Table 3.

Table 3

Table 3

Direction of consumption	Amount of consumption, percent					
	kerosene, gasoline	coal	gas	fuel oil	other types	total
For generation of electric power and thermal energy at electric power stations	--	--	100* / 0.03	--	--	100 / 0.03
For generation of thermal energy at boiler houses	0.08 / 23.67	0.11 / 8.48	69.60 / 22.05	28.94 / 52.66	1.27 / 58.34	100 / 26.7
For heating and heat treatment of metals	--	0.83 / 0.18	90.83 / 0.09	8.34 / 0.05	--	100 / 0.08
For output of nonfuel products	3.03 / 54.97	15.77 / 67.68	20.65 / 0.38	60.22 / 6.45	0.33 / 0.9	100 / 1.57
For municipal and everyday needs	0.38 / 9.93	1.93 / 11.92	76.9 / 2.06	19.45 / 3.0	1.34 / 5.26	100 / 2.26
For other needs (including with regulated consumption)	0.01 / 11.43	0.06 / 11.74	91.6 / 75.39	8.0 / 37.84	0.33 / 35.5	100 / 69.36
Total	0.1 / 100	0.4 / 100	84.3 / 100	14.6 / 100	0.6 / 100	100 / 100

*The numerator is the percent for the line, the denominator is the percent for the column.

The fact that on the whole 70 percent of the consumption of boiler and furnace fuel is not broken down by directions, but is entered in the column "other needs," immediately attracts attention. Is this not one of the main causes of the high level--nearly one-firth of the total amount, as was already indicated above--of the losses of fuel? It is well known that wherever there is no accounting, the losses are the greatest.

Let us turn again to Table 3. As we see, 84.3 percent of the demand for boiler and furnace fuel is met by means of such an efficient type of fuel as gas. But here three-fourths of its consumption are not broken down by directions. And only 22 percent of it goes for the generation of thermal energy at boiler houses. Another 14.6 percent of the demand of the sector for boiler and furnace fuel is met by means of fuel oil. And here more than one-third of its consumption is entered in the column "other needs," and only slightly more than half is consumed for the generation of heat at boiler houses. Given such an approach, without the elaboration and adoption of scientifically sound rates of consumption of fuel resources by

specific directions it is difficult, if at all possible, to solve the problem of increasing the efficiency of their use. In our opinion, the detailed study of the target directions of consumption and the breakdown of the so-called "other consumption" can be one of the means of identifying significant reserves for increasing the efficiency of the use of fuel and energy.

As was already stated, about 90 percent of the thermal energy consumed in the sector is generated at its own boiler plants. It is possible to judge the achieved level of the efficiency of the use of fuel for its generation from the indicators of the specific consumption of fuel per unit of output, kg/gigacalorie (Table 4).

Table 4

Specific consumption of fuel for generation of thermal energy	For the Ministry of the Petroleum Industry		Average for USSR	
	1975	1979	1975	1979
At electric power stations	170.0	168.5	174.8	174.0
At industrial production and regional boiler houses	175.0	171.4	178.0	174.0

Moreover, let us note that at the enterprises of the Ministry of the Petroleum Industry thermal energy is generated with an efficiency of 84.8 percent at electric power stations and 83.4 percent at boiler houses. On the average for the country both of these indicators are estimated at 82.2 percent. The higher level of efficiency of the generation of thermal energy at the enterprises of the Ministery of the Petroleum Industry is ensured due to the fact that three-fourths of the boiler houses in the sector operate on natural gas and fuel oil. But, to be sure, a great share of the labor of petroleum industry workers also lies in this. It must be taken into account that the specific nature of production, in particular, the large number and great distance of the production, municipal and everyday facilities from each other substantially complicate the designing and construction of centralized sources of heat supply and heating networks with high operating indicators and inevitably lead to the use of equipment of a small unit capacity. About 80 types of boiler plants alone, the level of the degree of economy of which is different, are operated at enterprises of the Ministry of the Petroleum Industry.

The further increase of the efficiency of the use of fuel resources in the sector should proceed in such directions as the replacement on a larger scale of obsolete boiler plants with new ones, their modernization or renovation, the use wherever possible of boiler houses with a large unit capacity, the improvement of operating boiler equipment, the use of improved burners, the timely adjustment and readjustment of equipment, the establishment of the optimum combustion, the increase of the standards of maintenance, including the timely cleaning of the heating surfaces on the gas and water sides, the cleaning of the burners and jets, the insulation of the surfaces of the lining and the reduction of inleakages of air. Such measures as the installation of additional waste gas heaters for the heating of drinking water and air by means of the use of the heat of the blowdown water and exhaust and the automation of combustion processes are yielding a good impact. Moreover, it is necessary to set up everywhere the collection and use of thermal energy from various kinds of technological installations.

In recent years many petroleum deposits of the country have entered the late stage of recovery, which is characterized by an increase of the amount of extracted fluid with the simultaneous decrease of the content of petroleum in it, by the need to inject greater and greater amounts of water to maintain the formational pressure and by the conversion of a larger and larger number of wells to the mechanized mode of production, including at the early stages of working. The majority of the new petroleum and gas deposits are being put into operation in remote and northern regions with difficult natural and climatic conditions, the number of small deposits and deposits located at great distances from established petroleum production centers is increasing. Deposits, which occur at a great depth and contain petroleums of higher viscosity, are beginning to be worked, the length of both intrafield and main petroleum pipelines is increasing, more and more petroleum has to be transported from far away to the regions with developed industry. All this taken together is leading to an inevitable increase of the consumption of fuel and energy resources per unit of product being extracted and for its transportation. Thus, in four years of the 10th Five-Year Plan the rates of consumption of energy resources for the production of 1 ton of petroleum and its transportation through main pipelines increased by 12 and 26 percent respectively. In addition to the reasons enumerated above this also occurred because at present the reserves for saving fuel and energy by means of the implementation of inexpensive measures to a considerable extent have been exhausted. Therefore the search for reserves to reduce the fuel and energy resources is being conducted on the basis of the development and introduction of advanced equipment and technology and the modernization of equipment, which, of course, requires certain material and financial expenditures. Without the performance of such work the increase of energy outlays on the production and transportation of petroleum would be even higher. Indeed, estimates show that the expenditures, which ensure the more efficient consumption of fuel and energy, as a rule, are one-half to one-third as great at the capital investments in the extraction of fuel and energy resources and their delivery to the place of consumption (N. K. Baybakov, "The Development of Socialist Planning," EKONOMICHESKAYA GAZETA, No 22, 1979). That is why when planning the fuel and energy balance of the sector and production associations the emphasis should be placed on the increase of the efficiency of the use of fuel and energy, while capital investments should be allocated first of all for these purposes.

The economical and efficient consumption of fuel and energy resources is a national economic task, therefore in the sector organizational and technical measures on the saving of fuel, thermal energy and electric power in such main directions as the perfection of production technology, the improvement of the use and structure of production equipment and the improvement of the use of fuel and energy are being elaborated at all levels of production management.

The drafting of plans of organizational and technical measures on the saving of fuel and energy resources entails some difficulties, which stem from the periodical nature of the drafting of such plans, as well as the limitation of the assets for implementing technical measures. Therefore it is very important to determine well in advance the source of financing of each of them. Let us recall that the financing of scientific research, experimental design and technological work and the recovery of the expenses, which are connected with the development and assimilation of new types of products and technological processes, are accomplished at the expense of the unified fund for the development of science and technology. The modernization of equipment can be accomplished both at the expense of the assets for capital repair and at the expense of the assets for capital construction. Here it

is necessary to take into account that the expenditures on the modernization of equipment, which is performed at the same time as capital repair, are taken into account in the norms of amortization deductions for capital repair. The expenditures on medium repair, the periodicity of which is greater than one year, are also included in the norms of amortization deductions for it. The expenditures on the modernization of equipment, which is performed when renovating enterprises, shops or individual facilities, as well as the expenditures on the renovation of fixed capital are not taken into account in the norms of amortization deductions for capital repair, and, consequently, the financing of such expenditures is achieved by means of the allocations for capital investments with the corresponding increase of the balance sheet value of the fixed capital. Thus, the implementation of a number of measures on the increase of the efficiency of the use and the saving of fuel and energy resources, which are connected with the modernization of equipment, at the same time as the performance of the capital or medium repair of this equipment makes it possible to a certain extent to decrease the need for capital investments for these purposes.

At present the implementation of any technical measure, which requires capital investments and the receipt of equipment, is usually accomplished in 2-3 years. It seems expedient to elaborate and adopt at all production associations a system of the continuous planning of measures on the efficient use and saving of fuel and energy resources and on the use of secondary energy resources for 2-3 years. The plan of measures should be of a permanent nature and be compiled annually for the indicated period. It should be comprehensive and contain such sections as the performance of designing and surveying work, the provision of equipment, the elaboration of technical and economic substantiations of the feasibility of adopting each measure and an estimate of the economic efficiency of its adoption, the sources of financing, the deadlines of the implementation of the measures and schedules of the performance of the construction, installation, start-up and adjustment work.

Some questions of the efficient use and saving of fuel and energy resources have been touched upon in the article. In our opinion, it is expedient to elaborate a uniform method for the entire sector of the continuous planning and implementation of these measures.

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ANOMALIES OF COAL TRANSPORT BY RAIL EXPOSED, REMEDIES OFFERED

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 10, Oct 80 pp 50-53

[Article by Yu. Grechanik (Moscow): "Coal: The Arithmetic of Haulage"]

[Text] With the growth in scale of production and intensification of specialization and cooperative arrangements, transport (primarily railroad) operations are acquiring increasingly great importance. Radical improvement in the organization of freight haulage and the more rational planning thereof and further improvement in transport-economics relationships require special attention. The solution of these questions depends greatly upon USSR Gossnab organs.

Our country is first in the world in coal mining. From year to year this mining continues to increase. This year 745 million tons of the combustible rock are to be extracted from its underground storage. Its share in the country's fuel balance, as was noted at the November 1979 CPSU Central Committee Plenum, will be increased henceforth.

Mining the coal is only half of the business. It still must be delivered to the customer. Tens of thousands of railroad cars are required daily for coal hauling. Even more of them will be needed tomorrow.

In its concern for the timely delivery of the national economy's most important freight, our country is paying great attention to developing railroad transport. New railroad lines and second and third track are being built. Switching yards and freight yards are being rebuilt. Traffic-control equipment is being improved. The fleet of rolling stock is being augmented increasingly by high-powered locomotives and high load-capacity railroad cars.

But development of the railroads' materials and equipment base is not the sole path to satisfying the rising demands for haulage. Improvement of the organization of haulage is a no less important way of improving the national economy's transport service. The existing situation with respect to coal haulage is convincing proof of that.

Not Freight, but Embarrassment

Unfortunately, the growth of coal mining in the country is being accompanied by a deterioration of coal-quality grading. Some lumps reach the meter size when the

permissible standard is 30 cm. The moisture, waste-rock, sulfur and ash content is raised. During the past 10 years the shipment of such low-quality product to power-engineering workers alone increased by 60 million tons per year.

For example, coal trains that travel from the eastern regions to the country's European part are often loaded with as much as 40 percent waste rock and moisture. This means that two-fifths of the rolling stock is used irrationally. And the largest amount of solid fuel is indeed transported on a specific route. A rise in its useful content by just 5 percent would free hundreds of thousands of cars.

In the winter an excessive moistness of coal causes it to freeze during transport into a monolith. It cannot be unloaded. You have to wait. A crusher requires not only expenditure of materials but also of time. Idle time is increased. Cars damaged during unloading have to be sent for repair prematurely. And again they are unemployed. As a result, rolling stock utilization is reduced extremely appreciably. The railroads haul much less coal than they could.

The high content in the coal of ash, sulfur and other impurities accelerates wear on the power-engineering equipment and even leads to breakdowns. Soyuzglavugol' [Main Administration for the Supply and Marketing of Coal under USSR Gossnab] knows about this. Nonetheless, the unimproved procedure for fuel shipment is retained. Coal differing in content is sent on a train under a single quality certificate. Responsibility has been vested in the Administration for Standards of USSR Minugleprom [Ministry of Coal Industry] for checking coal quality. That is, control is exercised practically by the shipper himself. A single all-embracing state standard for strict objective fuel-quality monitoring is lacking. As a result, power workers are compelled to concern themselves with monitoring the acceptance of arriving coal. However, the existing rules authorize this to be done only with the participation of a representative of the shipper. While awaiting his arrival, the cars frequently are not unloaded for several days.

Low coal quality poses many complicated engineering problems for power-engineering workers. They have to create new equipment that is designed to use coal that is not distinguished by good characteristics. It becomes necessary to erect high-powered drying installations and units.

But none of this solves the transport problem. Coal with increased moisture and waste-rock content nevertheless has to be transported.

Apparently, the way out from the situation that has been created consists of something else. Experience indicates that it is much better to upgrade low-grade fuel where it is mined. The technology of this process has been developed adequately. The USSR Minugleprom system already has such plants and installations. They process many millions of tons of coal per year. However, many more of these plants and installations are needed than exist.

Coal Is Brought to Coal

Such a situation is completely permissible if it is caused by extraordinary circumstances. Like these, for example. In 1974, mining at a strip mine that supplied Uzbekistan's Angrenskaya GRES, which was situated alongside the mine, had to be halted temporarily because of diversion of the river. It was natural that coal had to be brought in from far away.

However, the need quickly passed. But the combustible rock still continues to arrive from Kirghiziya. Sredazugol' [Central Asian Administration for the Supply and Marketing of Coal] supply organs did not take the refusals of these deliveries into account. Neither did they react to the fact that the arriving fuel, for which the GRES was not designed, led at times to wear on the power equipment. And only the growing accumulation of coal, which exceeded the permissible reserve severalfold, took effect. A way out of the situation that had been created was found. But how?! Ship Angren coal, for which the local GRES was designed, out to the ends of the earth--to Kazakhstan and Kirghiziya.

And the cross-hauling heavyweights began to roll. Some of them tore along from Kirghiziya to the electric-power station with uninvited freight. The others traveled in the opposite direction with the same amount of Angren fuel. And this continued not for a month and not for a year but for about 5 years. As a result, millions of tons of coal were hauled for which more than 30,000 railroad cars were allocated.

It would seem that the conclusion was obvious. And still this is not all that was done by far. In the plan for coal freight traffic for 1980 and succeeding years, Soyuzglavugol' again called for unit trains to and from Angren. Only a decisive objection by MPS [ministry of Railways] has prevented this hauling for the time being.

The events described form a brilliant example but one that is far from unique. There is cross-hauling not only on the Central Asian but also on other railroads. The Ukraine and West Siberia, we say, are "exchanging" coking coal. Millions of tons of it are sent each year from the Kuzbass to various parts of the UkSSR. Here it is made into coke and then returned to its native districts. As a result, the steel mainline on this route is extremely overloaded constantly.

Coking coal from the Donbass [Donets Coal Basin] travels in the opposite direction. And, of course, not without a "basis"--certain West Siberian enterprises require it. One of them because it is precisely Donets coal that is called for by the technology. A question arises in this connection. Why was the enterprise created so far from the fuel it would require? The Yurga Abrasives Plant also receives coke from the Donbass. The fact is that, when local solid fuel is used, "the specific consumption of coal and electricity increases." But the fact that the haulage costs much more, that the transportation operates under an enormous strain, was not taken into consideration.

Energy-producing coal from West Siberia is tossed over to the Ukraine in no small amounts. Can it be that the Donbass does not have a similar fuel? Then why is it shipped in almost the same amounts from there in the reverse direction to Gor'kiy and Yaroslavl'? Is it not expedient to replace shipments of Donets coal to these places by direct shipments from the Kuzbass [Kuznetsk Coal Basin]?

This question was studied by competent organizations. And a completely definitive answer was given to it. USSR Gosplan, jointly with USSR Gossnab, the Ministry of Railways, and other interested ministries and agencies, adopted a decision to curtail shipments of Donets coal to Yaroslavskaya and Gor'kovskaya Oblasts. Collective measures called for these oblasts to be supplied with Kuznetsk solid fuel. More than have 10 years have passed since then. The situation has not changed.

Great Distances Are Not So Terrible

These words from a song are true, as the economists assert, but not in all actual cases. For example, great distances are terrible for transporting coal. Over a certain threshold distance it becomes irrational. Such coal costs the consumer too much.

But evidently not everyone who plans transport-economics relationships has concurred with this. You come to this conclusion involuntarily when you find out about the growth in average distance for coal haulage by rail. During the last 4-year period alone it increased 98 km.

What are the negative consequences of this growth? Alas, they are not so small. During the first 4 years of the five-year plan, coal transport cost the customer 180 million rubles more than for the former distance. The amount of work done by the railroaders increased 75.5 million ton-kilometers. For the national economy this means the loss of a real possibility for hauling an additional 46.5 million tons of freight.

Of course, the fact that coal mining is growing mainly in the eastern regions, while the main consumers are in the country's European portion, cannot help but lead to an increase in distances for transporting coal. Unfortunately, aside from this inevitability, there are no few unjustified, excessively long routes. Thus, 1 million tons of Kuznetsk coal is shipped annually for more than 4,000 km to Arkhangel'skaya and Murmanskaya oblasts and the Karelian ASSR. Yet this is the zone of distribution of the most rich Pechora Basin fuel of a similar type.

Why does this occur? The main cause is the fact that Kuznetsk coal costs less than half as much. But of no little importance also is the fact that the railroad charges on superlong-distance haulage have been rescinded. Therefore, today its cost is such that even large-scale freight is allowed to be sent to the ends of the earth. So it is that the shipment of coal from the Kuzbass, although it is 2.5 times as expensive as coal shipped from the Pechora Basin, is still profitable.

However, this arithemetic is of local significance. It is not in accordance with the interests of national economic development as a whole. The decision to curtail haulage of Kuznetsk coal to Arkhangel'skaya and Murmanskaya oblasts and the Karelian ASSR because of the possibility of using Pechora Basin coal in these areas, which USSR Gosplan and USSR Gossnab adopted, is correct in paying attention to this.

The length of the steel track from the Kuzbass to Dushanbe exceeds 4,000 km. To Ashkhabad it is the same. To Tashkent it is one-third less. But such a distance does not embarrass those who do not ponder transport outlays or overloading of the railroads. And so about 400,000 tons of Kuznetsk coal is sent annually to municipal and domestic-services enterprises of the above-mentioned cities of Central Asia. Meanwhile, it would be advantageous to convert them to local fuel and to gas-mazut motor fuel. Indeed, the haulage costs customers 622,000 rubles and gives the railroaders 1.3 billion ton-kilometers of additional work.

This opinion was substantiated 11 years ago. USSR Gosplan, jointly with USSR Gossnab, MPS and other interested ministries and agencies, then adopted a decree on this question. It recognized the undesirability of the haulage named above by

virtue of the potential and necessity for converting Central Asia's municipal and domestic-services enterprises to local fuel. But the decree remains unimplemented.

When a Hand Is Offered

Excessively long distances, figuratively speaking, make one end of the cane that is the scourge of the railroads. The other is the short haul. The irrationality of the latter is in no way inferior to the first. The time a railroad car spends en route is insignificantly small in comparison with the idle time associated with loading, unloading, switching and other necessary operations. It does not exceed 5-7 percent of the turnaround time. Expenditures per ton-kilometer here are 8-fold to 10-fold those of system averages. The transporting of freight over short distances (less than 200 km) sharply reduces the beneficial utilization of rolling stock and the overall effectiveness of the steel arterials.

According to MPS data, last year 92 million tons of coal were shipped over distances of 100-200 km, 67 million tons over distances of 50-100 km, and 44 million tons over distances of 30-50 km. More than 105 million tons of solid fuel made the trip within a radius of 30 km. A long time was spent on these microroutes alone by 1.6 million railroad cars.

Nor are the statistics on reduction of short hauls too consoling. During the first 4 years of the five-year plan, the amount of coal shipped over distances of 50-100 and 30-50 km was reduced by 4 million tons. Simultaneously, the amount of solid fuel transported within a radius of 100-200 km increased by 6 million tons.

The time has come to wage a decisive campaign to rescue the railroads from the short hauls that are not characteristic of them. There are many ways to solve this problem. One of them is the development of continuous-operation type industrial transport: conveyerized transporters, suspended cableways and pneumatic-container pipelines. The effectiveness of these progressive types of transport is 1½-fold better than that of rail transport. Nevertheless, the necessary attention is not being paid to their wide use.

It is desirable to use even automotive transport over short distances, where the fuel customer is far from the railroad. Under any circumstances, the truck delivers the freight, as they say, from door to door (from the sender to the receiver).

Rationalization of coal haulage embraces a wide range of questions. Solving them most rapidly depends upon the joint efforts of numerous ministries and agencies, particularly of USSR Gosplan and USSR Gossnab, Gosstandart [State Committee for Standards], the USSR Ministry of Coal Industry, and MPS.

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'MODERNIZED' LONGWALL-MINING COMPLEX FALLS FAR SHORT OF EXPECTATIONS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Oct 80 p 2

[Article by G. Safronov, chief of the Section for Setting up Longwall Mining Complexes, of Spetsshakhtomontazh [Special Underground Mine Equipment-Assembly Administration], and correspondent B. Glotov (Abay-Karaganda): "Offhand"]

[Text] Karaganda Basin miners first saw the KM-130 longwall mining complex 6 years ago. At the Sokurskaya Underground Mine, where an experimental model was tested, it did not pass: twice it fell, folding up like an accordion. And so now they are testing it again, and again the results are far from brilliant. At the Churubay-Nurinskaya Underground Mine it fell into 30 sections.

"This phenomenon is temporary," we are assured by chief designer of the complex, V. Bernatskiy, and chief engineer O. Mertsalov, of Kargormash [Karaganda Mining Machinebuilding Association]. "The design just has to be refined a little."

This is the opinion of the complex's creators. But here is how the miners assess it.

"The new complex is much heavier than the old one, labor intensity of assembly operations has increased severalfold, and assembly takes more than twice as long," says V. Klobuk, chief of the Mine Installation Section of Spetsshaktomontazh.

"The KM-130 is now being used at four of the basin's underground mines," adds I. Tir, chief operating engineer for mechanized longwall complexes of Karagandaugol' [Karaganda Coal-Mining Association]. "Everyone who mines coal with it complains unanimously about its numerous design deficiencies. But the main thing is that the complex should yield at least 2,000 tons of coal per day from a longwall with difficult mining geology. Only in this case is its use economically expedient. Actually, average daily extraction does not exceed 300-500 tons."

You will agree that the miners' arguments appear to be more persuasive. And indeed the experimental model, which would have been only a small loss, is not the point. The complex is being built serially for the second year. With its help, the miners should, as they say, work to their utmost and mine coal, but instead of this they have to enter into debates. Why did this happen?

...Eight years ago USSR Minugleprom [Ministry of Coal Industry] gave Giprouglemash [State Design-Development and Experimental Institute for Coal-Mining Machinebuilding] the task of modernizing the KM-81 longwall mining complex. It cannot be said

that it was bad. The miners mined many a million tons of coal with it. But in time the miners began to feel increasingly sharply the need for a more reliable and productive machine, one able to work successfully under difficult mining-geology conditions.

Well, the designers decided to modernize it, so they set about to modernize it and they got down to business. But basically, judging by everything in general, they laid down the principle: if it is short, lengthen it; if it is light, make it heavier. In order, for example, to "couple" the jacks for moving the roof supports, they lengthened the sections on the old complex. The KM-81's roof supports were not very reliable so they reinforced them. So the new mechanized roof support was gaining weight and accumulating metal imperceptibly. When they totaled up the final results, it was found that the supports' weight had been tripled--more than was permitted under the terms of the modernization charter.

According to the law, everything was supposed to begin all over again in such a situation. However, the designers did not trouble themselves with new, original solutions. "Since we did not stay within the framework for modernization," they decided, "we shall produce the complex as a new machine."

This, in brief, is the history of the KM-130's birth. In 1974-1975 two industrial models were fabricated at the Novo-Karaganda Machinebuilding Plant (now the head enterprise of Kargormash). Staff workers of Giprouglemash and the Kargormash design office have not been stinting in praise for their offspring. However, miners of the Raspadskaya Underground Mine, where the main tests were conducted, expressed many serious unfavorable observations. In their summary, the main thought expressed was the fact that the cutter-loader and the oil-pump facility were not capable of meeting the designed performance.

Certain deficiencies were then eliminated. But, as before, this was done, as they say, in an offhand manner, although it is well known that such an approach inevitably leads to a different type of complication, and, in the final analysis, to delay in creating the new machinery. And that is what happened: more than 6 years passed before the first model saw the light of day, and the stronger cutter-loader and high-capacity pump facility attached to it still did not hold up under the tests and require serious refinement.

The miners have for many years been expecting machinery for difficult longwalls, but they received an unimproved complex which has not demonstrated stable operation anywhere as yet, except, perhaps, at mines with favorable mining geology. In the Kuzbass [Kuznetsk Coal Basin], for instance, four KM-130's were given a work-out for 11 months in all--that is, each operated an average of less than 3 months, and were idle for the rest of the time because of various breakdowns. What kind of an economic benefit can it boast of? Indeed, the new complex is twice as expensive as the old one.

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CONSTRUCTION STARTS ON URENGOY-PETROVSK GAS PIPELINE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Oct 80 p 1

[Article by R. Yevseyeva (Ufa): "The Fifth Ray of Urengoy"]

[Text] The small settlements of Romanovka and Berezovka in Bashkiria and the minute Agrish in the Transurals became the first support centers for the builders of still another huge fuel and power trunk line, which has its origin in the gas storehouses of Urengoy. Subunits of Glavvostoktruboprovodstroy [Main Administration for Pipeline Construction in the Eastern Regions] expanded their mechanized columns here and simultaneously began work on the northern and southern sections of the gigantic pipeline route, which heads for Petrovsk in Saratovskaya Oblast.

Builders of Nefteprovodmontazh [Trust for the Construction of Oil Pipelines] are to do 54 km on the northern "shoulder" and 155 km on the southern one.

"About 3,000 pipelength-sections have already been prepared on racks for pipeline welding," says V. Anikiyenko, trust chief engineer. "The first kilometers of pipe for the future trunk line have been welded from them into a strand and insulated on the sections of Ya. Afanas'yev and V. Belousko. And so one of the largest construction projects of the Eleventh Five-Year Plan has already been started. All the work lies ahead, and it is immense...."

Yes, construction of the new section of the trunk gas pipeline, which stretches for 2,740 km, staggers the imagination. It is planned that the operations will be conducted practically at the same time along the whole route. Outfitting of the construction and installing flow-line operations groups in all Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] subunits that will take part in the new construction has started. They will lay the fifth blue ray in a row from Urengoy, over which valuable hydrocarbon raw material will be sent to parts of the Urals and the Volga regions and to the Central Economic Region.

The trunk line will have to be brought through regions that are difficult for the builders who will work on the line. More than 1,500 km, that is, more than half of it will pass over the taiga, 224 km will pass through difficult swamps, 240 km over rock, and about 120 km of the route will pass over permafrost soils. In order to protect the pipeline from the "caprices" of the permafrost, without disturbing the existing ecological equilibrium, it was decided to lay the pipeline on the surface, on artificial fill. And for this purpose--still another complexity!--soil will have to be brought here over sticky swamp mud....

The new route is to cross railroads and highways 136 times and to pass through 13 large rivers. According to the calculations, Minneftegazstroy divers will have to lay about 100 km of underwater pipeline, because of flood conditions. Thus, not only is a 14-km crossing to be erected across the Ob', but crossings will also have to be built over lesser-known rivers--a 7.8-km crossing over the Sok and one of 10 km over the Nadym. By way of comparison: the crossing of the Volga, which the new route will have to master, is only 5.6 km wide.

Complexities await the builders also in the flat country. The new route is to pass through fertile regions of Orenburgskaya, Kuybyshevskaya, Ul'yanovskaya and Saratovskaya oblasts and across the Bashkir and Tatar ASSR's. The design calls for land recultivation over a distance of almost 900 km. The builders must return the upper plowed soil layer to the land users in its original condition.

There is still another feature of the new route. It will be the first line of a future multilane transport system, and so the builders, even today, must prepare work areas to take later developments into account. New trunk lines to Yel'tsa, Novopskov and other places will be laid along this corridor in the future.

The trunk line, whose throughput will be 32 billion cubic meters of the "blue fuel" per year, will become a part of the country's unified automated gas-supply system. Already today the construction of connectors to the existing Nizhnyaya Tura-Perm', Kazan'-Gor'kiy, Saratov-Gor'kiy and Orenburg-Zainsk gas pipelines is called for.

Construction of the new gas pipeline is to be completed in 1982. But Minneftegazstroy builders, in undertaking a drive in honor of the 26th CPSU Congress, have decided to apply all their efforts to accelerating the work and to introducing the trunk line into operation ahead of time.

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LARGE NEW COAL MINE IN DONBASS NEARLY READY FOR OPERATION

Kiev PRAVDA UKRAINY in Russian 4 Nov 80 p 1

[Article by N. Ladanovskiy (Donetskaya Oblast'): "The 'Zhdanovskaya-Kapital'naya' Is Ready for Startup"]

[Text] "Do you want to see Donbass's tomorrow?" said A. N. Nikhaylov, chief engineer of the newly built Zhdanovskaya-Kapital'naya Underground Mine, smiling and lighting up a "konogonka" which runs above the mine face. "This is the first northern longwall, and tomorrow coal will go to the surface from it."

The arch of the mine face stretches almost continuously, with closely placed roof supports. Having noticed that I was lost in admiration for the underground "roof," Aleksandr Nikolayevich said:

"Our miners work under this reliable 'sky'--the support sustains any pressure--in all five longwalls of the mine's first phase, which will go into operation in the last days of December. Incidentally, a year earlier than planned."

I found myself at a mine face not at all ordinary--at an experiment at the Zhdanovskaya-Kapital'naya mine, the largest in the Donbass, which is under construction--just when it was being prepared for an operational test of the longwall, which is equipped with the first-class KM-88P mechanized longwall mining complex that has increased reliability and is manufactured in accordance with the latest word in mining science and technology.

We were conversing with the mine's chief engineer for mere minutes while sections of the hydraulic support, which had been built single-file along the longwall, were fitted together into a precise 200-meter file and attached to the conveyor. In ordinary longwalls with integrated mechanization, such construction lasts up to 2 hours. Although the hydraulic supports being used are mechanized, the miner still spends no little manual labor adjusting them along the height of the mine face. He must loosen the screw that attaches the sliding upright, adjust the height of the section, and then tighten the screw again. But here, at the first northern longwall of the newly built mine, it was sufficient for the miner to work the switch handle two or three times, and the section automatically adjusted itself to the thickness of the coal seam. The secret of such clever actions was in the double hydraulic extensibility of the support.

The Zhdanovskaya-Kapital'naya mine, which is being equipped, is one of the country's largest and most modern coal enterprises. Its designed capacity is 3.6 million tons of coal per year.

The design calls for the use here of the newest KM-88P complexes, which have been converted to hydraulic operation, sectional trains and high-capacity TL-80 conveyors. For the first time in the Donbass, a crushing and gobbing complex, which permits rock to be left in the excavated space, will operate at this mine.

Such an innovation as a specially built ventilation installation with a capacity of 24,000 cubic meters of air per hour has been used. It will provide for rhythmic operation of all five future mining longwalls. Great attention has been devoted to centralized monitoring and control of production. In particular, the mine controller's position is to be equipped with the newest technological means, including electronic computing equipment. Thanks to the high degree of mechanization and automation of the coal-mining processes at the enterprise, a comparatively small number of people will be employed.

The first phase, with a designed capacity of 2.1 million tons of fuel per year, was built by a speedy method that took into account advanced experience in erecting facilities in other branches of heavy industry. Construction workers from 14 trusts and 35 mine-construction administrations--in all, more than 6,000 people--were employed at the new construction project. Since the start of construction, the collective of the general contracting Artemshakhtostroy [Artem Mine Construction Trust] and subcontracting organizations have assimilated 134.5 million rubles in capital investment in a short time here and have done more than 40 km of underground excavation.

Was success achieved because of this?

"All the facilities were erected in accordance with progressive industrialized technology, using economical modularized construction," says P. K. Surzhenko, chief of the technical division of Donetskshakhtostroy [Donets Coal Basin Mine Construction Combine]. "Thus, the tunneling headframe was erected on a platform and then raised upwards in parts. For the first time in world practice, the new construction project used mobile instead of stationary tunneling equipment--compressors, lifting machines, ventilators...."

Tunneling collectives--about 20 brigades--made a great contribution to construction of the Zhdanovskaya-Kapital'naya mine, carrying out a major volume of the preparatory work.

The example-setters of socialist competition at the construction site deserve special praise: the high-speed brigades of V. Shturmak, from the general-contracting administration No 2 of Artemshakhtostroy, and of A. Nosov, from Administration No 6 of Donetskshakhtostroy. Each month they tunneled 200-250 running meters each of mining excavation.

Yesterday the first northern longwall of the mine produced its first mine car of anthracite. This means that the Zhdanovskaya-Kapital'naya will go into operation ahead of time.

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ELECTRICAL UNITS PROTECT TULA GAS PIPELINES

Moscow ZHILISHCHNOYE I KOMMUNAL'NOYE ZHOZYAYSTVO in Russian No 8, Aug 80 pp 32

[Article by Ye. N. Zakhvatov, head of the Tula office of Podzemmetallizashchita: "Reliable Protection for Gas Pipelines"]

[Text] The gas industry of the Tul'skaya oblast is a complicated set of engineering structures. It is enough to say that the active pipelines extend about 4,000 km. There are 996 electrical protection units (EPU) to guarantee their continuous and safe operation. A considerable number of gas pipelines are in complicated corrosion conditions. They are exposed to the effect of both sources of stray currents of surface and underground transportation, and electrochemical soil corrosion. The soil water with increased pH is also unfavorable for the gas pipelines. All of this requires rapid solution to questions of design,construction and repair of the EPU.

A lot has been done in this direction by the Tula office of the Podzemmetallizashchita. The office has an excellent production base in a four-story building that is wonderfully equipped with offices, auxiliary rooms and a 350-seat assembly hall.

There is a covered warehouse and heated garages for 20 automobiles, and a mechanical workshop with machine fleet, showers and dressing rooms equipped with everything necessary. All of this creates the prerequisites for the creative and purposeful work of the subdivisions and shops. Last year the collective successfully coped with a large volume of work (1 million rubles). This was unthinkable without the precise and highly organized mechanization of the labor-intensive processes in construction and repair of the electrical protection. The excavating, drilling and automobile transportation equipment has been completely replaced and updated in a short time. New technology for installing the EPJ has been introduced and mastered.

The ETTs-161, ETTs-220, E-153 excavators, telescopic derrick AGP-12-U and UGB-50 drilling rigs that were acquired last year were of great advantage. The reception of 50 km of cables and 400 T of pig iron pipes permitted centralized fabrication of all the assemblies and parts for building the EPU in the mechanical workshop with a stage-by-stage method of building electrical protection on a sliding schedule. The result was a doubling of the labor productivity and increase in the quality of the construction-installation work. Two hundred bases for the EPU, 1500 cable connecting pieces, 5000 terminals, 700 mats and 1200 crosspieces were developed and manufactured. This permitted construction of 150 electrical protection units, major repair of 100 circuits of anode grounding electrodes, laying of 30 km of drain cable and 25 km of drain pipes, and completion of 100% protection of the gas pipelines in the Tul'skaya oblast in condensed periods.

The intensified plans of organizational and technical measures of the current year have forced us to systematically and rhythmically fulfill a set of both operational and construction-installation work from the very first days.

This year the volume of work for complex protection of the engineering structures will be R 40,000. The 4 complex sections that were set up in the cities of Yefremovo, Aleksino, Novomoskovsk and Shchenkino will permit a considerable improvement in the operation of the electrical protection units and their repair. All the sections are equipped with the necessary automobile transportation and excavation equipment. Good production bases are being built at three of them; two in the cities of Yefremovo and Aleksino will start up this year.

We are confident that the introduction of the new forms of servicing the EPU and the creation of a repair base in Tula for centralized repair and inspection will permit us to attain a coefficient of simultaneous operation of the protection units that is no less than 96%. Four hundred units of varying equipment will be inspected and repaired by the new industrial methods of production technology.

We are also introducing progressive methods into the installation of AGK-2U, AMKO, KSR and KSU type automatic units. A powerful preparation section for centralized preparation and assembly of large-block units and parts has been organized for this purpose. Stands are being made for assembly, installation, welding and testing of whole boiler blocks, bringing the level of their installation readiness to 90-95%. Stands are also being made for polishing cranes and cut-off fittings that have been used. They are subsequently re-used in production.

The first samples of large-block assembly of automatics in workshop conditions were mastered by the 100th anniversary of V. I. Lenin's birth. The complex construction-installation brigades will completely replace the steel electrodes with pig iron and layered graphite ones during 1980-1982. New equipment and technology for the recently organized sections, new instruments and mechanisms (they will be made and introduced by our specialists) are also in the list of imminent work.

But it goes without saying thqt the collective is capable of this and much more. Such masters of their work likedriver N. S. Kuchayev, excavator V. M. Luk'yanov, mechanic S. A. Il'inskiy, head of the mechanical workshop A. Ye. Sorokin, head of the operation shop Yu. A. Prokhorov, and electrician V. V. Danilov are in this collective.

All the workers of the Podzemmetallzashchita office are compared precisely to the leading workers. They are laboring under the motto: from a model working place to a model shop and enterprise.

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COMPARATIVE STUDY SHOWS POSSIBILITY OF USING DOMESTIC FURNACE FUEL

Moscow ZHILISHCHNOYE I KOMMUNAL'NOYE KHOZYAYSTVO in Russian No 8, Aug 80 p 33

[Article by O. N. Chikova, V. I. Yerofeyeva, A. S. Shvarts and R. I. Sergeyeva, Giproniigaz: "Domestic Furnace Fuel: Research Results"]

[Text] Domestic furnace fuel (DFF) that is a product of the direct distillation of oil and secondary processes of refining is being used more and more in the localities that are very far from the main gas lines.

The use of DFF permits automated operation of the heating units, reduction in the expenditures to maintain the service personnel, improvement in the sanitary and hygienic conditions in the residential and production areas, and considerable reduction in air pollution.

In our country, where special attention is given to environmental protection, all the processes associated with the release of harmful substances are controlled by sanitary and operating organizations. Therefore when new types of fuel and boiler units are introduced a comprehensive check must be made of possible environmental pollution.

In order to clarify the nature of the harmful admixtures that are released during DFF combustion, studies were made on the furnace fuel manufactured by the S. M. Kirov Saratov Oil Refinery. This fuel is a mixture of gas oil and residue of oil thermocracking (TU 38001-50-71). Its temperature for the beginning of boiling is 188°C and for the end of boiling 332°C. Its sulfur content is 0.75%.

Simultaneous studies were made on diesel fuel (GOST 305-73) since it is close to the directly distilled fuel in its characteristics.

The following burners were selected for determinationof the composition of the DFF combustion products: UGTP-07 that is designed to burn fuel in specific heat heating and heating-cooking furnaces (developer--Giproniigaz [State Planning and Scientific Research Institute for Planning Institutions of the Gas Industry], producer--Saratov plant Gasapparat), model 52-03 device for incorporating into specific heat (lining) heating and heating-cooking furnaces (manufacturer--Donetsk Plan of Gas Apparatus), and finally, the nonspecific heat unit model PO-1M for warming living areas named "Apsny" (it is manufactured by the Sukhumi Experimental Plant of Gas Apparatus).

The main specifications of these devices are presented in the table.

Indicator	Gas burners UGTP-07	52-03	"Apsny"
Heat load, kcal/h:			
constant	-	8000±400	-
maximum	14,000	-	9000
minimum	2000	-	2500
Fuel consumption, l/h:			
maximum	1.66	1	1
minimum	0.24	0.25	0.28
Holding capacity of fuel tank,l	15	15	15
Weight, kg	20	15	50

The combustion products were taken from the furnace flue into which the burners had been installed.

A vacuum was created in the flue for UGTP-07 and 52-03 by natural draft and it was set with the help of a damper. A draft was created by force (fan) in the testing of the "Apsny" apparatus. The vacuum was measured by theTNZh-N draft pressure gage in the fire box for the UGTP-07 and 52-03 burners, and on the vertical flue section under the damper during the operation of "Apsny."

In order to trace how the different combustion patterns affect the composition of the combustion products the vacuum was varied from 10 to 30 Pa. The fuel consumption corresponded to the certificate data of each device, and the minimum, maximum and intermediate were selected.

Sulfur dioxide, carbon monoxide and other components were analyzed in the combustion products. The study employed the analytical methods recommended by the public health organizations for a sanitation evaluation of air pollution.

It was established that the content of carbon monoxide in the combustion products did not surpass the normal for the gas burners 52-03 and "Apsny" when the certificate combustion patterns were observed, and for UGTP-07 with the maximum fuel consumption. With a reduction in fuel consumption in UGTP-07 the CO content increased, and with the minimum consumption (0.3 l/h) and vacuum of 10 Pa it was triple the normal.

The sulfur dioxide content fluctuated in broad limits (90-700 mg/m^3) depending on the combustion pattern. Its concentration increased with a reduction in fuel consumption and a drop in the vacuum in the flue. Thus for the 52-03 unit with maximum fuel consumption of 10 l/h and 30 Pa vacuum the sulfur dioxide content was 90 mg/m^3; with 0.3 l/h and 10 Pa vacuum it rose to 700 mg/m^3.

Attention is drawn to the low content of hydrogen sulfide (10-20 mg/m^3) as compared to sulfur dioxide. This is explained by the fact that hydrogen sulfide burns easily before sulfur dioxide when there is an oxygen surplus. When there is an oxygen shortage it burns before free sulfur that also burns before sulfur dioxide. There are insignificant quantities of nitric oxides (0-5 mg/m^3). At the same time one can trace a trend towards their increased content with greater output of the burners (here the temperature in the combustion zone is increased and the most favorable conditions are created for oxide formation). Phenol, acetone, benzene, methanol, formaldehyde, acetylene and hydrocarbons were not found in the combustion products.

When the burners operate on diesel (direct distillation) fuel the sulfur dioxide concentration in the combustion products was considerably reduced since the content of sulfur in diesel fuel is one-third of the DFF.

Combustion products were studied from the boiler units operating on DFF. The results demonstrated that carbon monoxide does not exceed the normal (0.01-0.03%). The content of the remaining components fluctuated in insignificant limits (sulfur dioxide 140-250 mg/m^3). This indicates the stable operation of the boiler units on DFF despite the fact that several batches of fuel were obtained during the heating period.

Thus, an analysis of the combustion products formed during the combustion of domestic furnace fuel on different burners showed that the environment can be polluted mainly by carbon monoxide, sulfur compounds and nitric oxides. However this pollution generally occurs in quantities that doe not exceed the maximum permissible concentrations. It is recommended that the burners operate with the maximum fuel consumption in order to reduce the toxic substances in the combustion products.

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FUELS

NATURAL GAS SUGGESTED AS SOLUTION TO INCREASED EFFICIENCY OF DRYING EQUIPMENT

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 17 Oct 80 p 2

[Article by Yu. Gudkov, head of the Main Administration of the Gas Industry of the Kazakh SSR Council of Ministers and E. Tynybekov, head of the department for the use of heat and gas of the Alma-Ata Architectural and Construction Institute: "Perfect the Drying System"]

[Text] In recent years no branch of industry in our country has developed at such rapid rates as the gas industry. At the same time the demand for gas is very great. This obliges us to have an extremely prudent attitude towards its resources by focusing the most attention on the selection of the most effective directions for its use, and the establishment of the most efficient sequence for conversion into the natural raw material of individual consumers.

Due to certain technological advantages of natural gas the main part of its extraction is currently used in different energy-intensive production units, in boiler houses, in dryers and furnaces of varying purpose. The problems of improving the efficient use of natural gas in them are diverse and urgent.

In modern concepts, the main task of drying units is not simply to reduce the moisture content, but also to maintain the high qualitative indices of the original moist product in the material. We will dwell on individual examples of the effective use of drying equipment that at first glance are unexpected.

In natural drying of hay or its storing in a silo, the nutrients are not completely preserved. Losses of such substances during storing in a silo are governed both by the useful, and the undesirable vital activity of microorganisms and the outflow of sap. In air the significant losses of nutrients that reach 50% are due to the respiration of the living plant cells, the activity of microorganisms, self-warming, mechanical wastes and washing.

It is known that at the final stage of development the plants are not very suitable for feeding animals. They are more effective as fodder in the middle developmental stage. If they are artificially dried, then with correct organization the dry product practically preserves the composition, color and aromatic properties of the green fodder, i.e., in this case there is a guaranteed production and preservation of feed of high quality even under poor weather conditions (compare straw and green plants). On the whole the correct use of artificial drying of feed can double the collection of nutrients from a field and permit purity during transporting, storage, dosing and subsequent distribution.

Thus, for example, the United States widely employs drum units to dry lucerne, while the French firm "Promin'"offers a number of such drying units with output of 1.5-10 tons per hour according to moisture evaporated. The Swiss driers "Kunts" are manufactured in 7 type sizes with output of 2.2-30 tons of evaporated moisture per hour. The Swiss units are used in a special design primarily for drying potatoes. In the GDR the output of units for these purposes has been brought to 4,000 h per year. The UT-67 dryer from the GDR has output according to the original product (green fodder) of 10-12 tons per hour. It consumes 12 gigacalories of heat and has electrical power of 310 kw. Converted into extant prices (1 cubic meter of natural gas costs 1 kopeck) the operating outlays of natural gas and electricity for dehydration of a ton of green fodder is 2 rubles 10 kopecks. With correct solution of the entire set of interrelated questions of fodder production such outlays are acceptable. Further reduction in the energy outlays can be attained by the use of active ventilation of the hay by warm air. Natural gas is the most convenient and the least expensive power source for such ventilation.

The problem of timely and high-quality drying of grain in the rainy period of the harvesting season is an urgent question in the republic. Powerful recirculation-isothermic units have currently been developed and are being introduced in the country for this purpose. The list of drying methods being developed with lower output, that are necessary for stationary design, especially, for the deep regions of Kazakhstan is fairly diverse. It has been proven that the use of natural gas in specialized units makes them easy to control and highly efficient.

The list of types, plans and tasks solved by driers in other branches can be expanded. For example, it is necessary to dry ceramic slip, chalk suspensions, ammophos, disodium phosphate, bone glue, thermosensitive lacquers, paints, blood, milk, lumber, limestone, root crops, and so forth.

It is consequently extremely important to select from the available technological drying methods the most economical variants. The method of spraying thermosensitive suspensions and solutions (lacquers, paints, milk and other products) in a vacuum is of definite interest in this respect. It was developed and introduced by the colleagues of the department for the use of heat and gas of the Alma-Ata Architecture and Construction Institute. In the new unit the temperature of the drying agent with the same energy outlays and drying time (6-10 seconds) as in standard spraying driers is reduced from 220 to 30°. As applied to the dairy industry, for example, this solves the technical and social problem of preserving the original quality of the products during dehydration, since at high temperatures the dry milk powder rots and to a considerable degree loses its original properties. The conversion of this drier to gaseous fuel will permit an even greater improvement in the technical indicators.

However, the rates of development and introduction of such units cannot satisfy the multiple-branch production needs. The reasons for the situation that has been created are the most diverse, but the chief reason is the poor attention to drying problems in the creation of technological processes for new industries and the updating of the active ones, the low production of the appropriate mechanisms, the shortage of technical means of control and the low level of automation of the drying units, and lack of completeness in the delivery of this equipment (mainly gas).

All of these reasons have a full effect on the demands and needs of our republic. This is not only a case of the lack of a comprehensive approach to planning, or the lack of individual construction standards and rules, but of the threatened lagging in important branches of the national economy, and significant losses of necessary raw materials and items. It cannot be permitted that the problems of a highly efficient use of the drying equipment and natural gas in the future remain outside the visual field of the Ministry of Agriculture, the Ministry of Agricultural Construction and other interested ministries and departments, and the republic Gosplan. The successful resolution of this problem in the 11th Five-Year Plan will permit an intensification of production, acceleration of scientific and technical progress, and guarantee of a further increase in labor productivity.

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USE OF ELECTRIC DRILLING INCREASES VOLUME OF TURKMEN WELL CONSTRUCTION

Ashkhabad TURKMENSKAYA ISKRA in Russian 1 Nov 80 p 2

[Excerpts from article by Yu. Razvalyayev, head of the production department of electric drills of the Kotur-Tepinskiy administration of drilling operations: "Effect of Electric Drills"]

[Text] A unique anniversary is being celebrated these days in the capital of the Turkmen oil workers, Nebit-Dag. Twenty years ago the brigade of drilling foreman Yu. Kerimov began to drill well No 193 with a new type of stoping motor, and electric drill. Since then electric drilling has become firmly entrenched in the production practice of the Turkmen oil workers. Two decades in the development of the branch is a short period, and possibly such an anniversary would have passed unnoticed if electric drilling did not have such clear advantages over other tunneling methods. Today the specialists associate the future of drilling and the attainment of the highest indicators and economic effectiveness in this branch with electric drilling.

The success of the electric drillers became possible thanks to the constant introduction of more and more advanced equipment. The current feeding system was significantly updated, the stoping motor was improved, and systems of remote control of the drilling processes, AVT-2 type automatic machines for feeding the bit into the face, reducer-inserts and other equipment were introduced. It is no exaggeration to say that the areas drilled by the association "Turkmenneft'" have become the site for testing and introduction of new equipment. The majority of developments of the special planning-design and production office for deep-well electric equipment to drill wells and extract oil have passed production tests at the field and received operating permits in a comparatively short time. This equipment includes electric drills 185 and 290 mm in diameter, shortened electric drills, reducer inserts of varying modifications and type sizes, remote measuring systems, electric drilling control stations, and heat-resistant cable sections.

The close cooperation between the designers, operators and workers of the All-Union Scientific Research Institute of Drilling Equipment helps to introduce the best achievements in electric drilling into production faster.

The skilled workers see a distinct improvement in the design of the stoping motor. But it seems to us that the potentialities here have still not been exhausted. This allows us to see electric drilling as a developing and the most promising direction.

The reliability of this equipment has risen significantly. This permits the use of forced drilling patterns and perfection in the well design. The electric drill 290 mm in diameter that was developed by the Khar'kov specialists on the initiative of the Turkmen oil workers guarantees high quality of the well shaft, is more reliable to operate, and increases the tunneling per bit.

The use of reducer inserts expands with each year. They also permit an increase in the rate of well tunneling. The quality of the cable sections that are made by the plant [illegible]-inskkabel" has improved.

Deep drilling requires increased reliability of the equipment, including the drilling pipes. The creation of drilling pipes with direct lock and single-contact conductor shifted towards the pipe wall is a shock-worker design solution. They are used to make super-deep wells. Such pipes are especially important for us since the drilling depths in west Turkmenistan are always rising.

The remote control system for the axial load on the bit affords great possibilities. Its first tests in our country were made at the association "Turkmenneft'." The electric drills of the new system of hydroprotection, conductor sections made under special production control, and new patterns of finishing bits have successfully passed industrial testing. In a word, the electric drillers are receiving ever greater opportunities to select drilling patterns that guarantee the maximum well tunneling.

There is one important feature of electric drilling. It requires the most serious and cautious attitude, high production efficiency, high degree of maintenance and high qualification of the specialists. This is why a rolling-repair shop of electric drills was set up in Turkmenia in the first years when electric drilling was introduced. Since then it has been considerably modernized. It has been responsible for the manufacture and start-up of many test stands and other special equipment for the assembly, testing and repair of electric drills and their set-forming parts, motors, conductors and remote control systems.

One of the important tasks of introducing electric drilling, provision of this important branch with highly qualified personnel, is being solved. Many scientific research organizations and industrial enterprises of the country, especially of Azerbaijan and Bashkiria, are helping us in this matter.

There are however, tasks in electric drilling that require a basic solution. In the first place this is the question of material supply. Drilling does not yet have a supply of new models of equipment. This is why we have a number of incomplete, old or nonseries electric drills which increases the volume of repair and has a negative effect on the net cost of the work. Individual assemblies of the electric drill need further development. A gas-resistant conductor is extremely necessary.

The drillers are waiting for delivery of equipment that is series-produced, highly reliable and made with regard for the latest scientific achievements and in the necessary amounts.

The USSR Ministry of the Petroleum Industry has made a decision to increase the volumes of electric drilling. The Turkmen drillers met this decision with satisfaction and complete approval. We in turn are resolved to use all reserves of this method of well drilling and to meet the imminent 26th CPSU Congress and 22nd Congress of the Turkmen Communist Party with new accomplishments and labor gifts.

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BRIEFS

DRILLING RIG--The world's first self-propelled drilling rig UKB-3ST-E based on the TT-4 tractor was made in the special design office of the all-union production association "Soyuzgeotekhnika." It is designed to drill vertical and inclined wells up to 300 m deep with hard-alloy and diamond bits on hard minerals under difficult taiga conditions. The rig is equipped with a comfortable, heatable area that provides a considerable improvement in the working conditions of the service personnel. The rig's tower is completely covered with a soft hood. The insulation from the environment permits the inner temperature to be maintained at +13-20°C while the air temperature is -40°C. The machine and pump electric motors are powered from a diesel generator unit driven from a transport motor of the tractor. This permits the use of electricity for general needs. The rig is being manufactured at the Sverdlovsk V. V. Vorovskiy Machine Construction Plant. [Text] [Moscow RAZVEDKA I OKHRANA NEDR in Russian No 9, Sep 80 back cover] 9035

TRIMARAN DRILLING RIG--The floating drilling rig is built on three identical seagoing frames. It is transported great distances by a tug, and is self-propelled for short distances. Drilling can be done with the help of the impact-cable and rotational method to a depth of 100 m from the water surface. [Text] [Moscow RAZVEDKA I OKHRANA NEDR in Russian No 10, Oct 80,inside back cover top] 9035

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